Name:

at1119paper: Complete the Square, b = odd (v518)

Example

By completing the square, find both solutions to the given equation:

$$x^2 - 59x = -814$$

Add $\left(\frac{-59}{2}\right)^2$, which equals $\frac{3481}{4}$, to both sides of the equation.

$$x^2 - 59x + \frac{3481}{4} = \frac{225}{4}$$

Factor the left side.

$$\left(x + \frac{-59}{2}\right)^2 = \frac{225}{4}$$

Undo the squaring.

$$x + \frac{-59}{2} = \frac{-15}{2} \quad \text{or} \quad x + \frac{-59}{2} = \frac{15}{2}$$
$$x = \frac{59 - 15}{2} \quad \text{or} \quad x = \frac{59 + 15}{2}$$
$$x = 22 \quad \text{or} \quad x = 37$$

Question 1

By completing the square, find both solutions to the given equation:

$$x^2 + 57x = 1638$$

$$x^2 + 57x + \frac{3249}{4} = \frac{9801}{4}$$
$$\left(x + \frac{57}{2}\right)^2 = \frac{9801}{4}$$

$$x + \frac{57}{2} = \frac{-99}{2} \quad \text{or} \quad x + \frac{57}{2} = \frac{99}{2}$$
$$x = \frac{-57 - 99}{2} \quad \text{or} \quad x = \frac{-57 + 99}{2}$$
$$x = -78 \quad \text{or} \quad x = 21$$

Question 2

By completing the square, find both solutions to the given equation:

$$x^2 - 13x = 264$$

$$x^2 - 13x + \frac{169}{4} = \frac{1225}{4}$$

$$\left(x + \frac{-13}{2}\right)^2 = \frac{1225}{4}$$

$$x + \frac{-13}{2} = \frac{-35}{2} \quad \text{or} \quad x + \frac{-13}{2} = \frac{35}{2}$$

$$x = \frac{13 - 35}{2} \quad \text{or} \quad x = \frac{13 + 35}{2}$$

$$x = -11 \quad \text{or} \quad x = 24$$

Question 3

By completing the square, find both solutions to the given equation:

$$x^2 - 37x = -300$$

$$x^2 - 37x + \frac{1369}{4} = \frac{169}{4}$$

$$\left(x + \frac{-37}{2}\right)^2 = \frac{169}{4}$$

$$x + \frac{-37}{2} = \frac{-13}{2} \quad \text{or} \quad x + \frac{-37}{2} = \frac{13}{2}$$

$$x = \frac{37 - 13}{2} \quad \text{or} \quad x = \frac{37 + 13}{2}$$

$$x = 12 \quad \text{or} \quad x = 25$$